DESIGNING 'SAFE' SCHOOLS: Identifying Areas of Research in Achieving School Safety and Security

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Abstract: Multiple stakeholders have an interest in making our schools 'safe' places to learn and work. Among these are students and parents, law enforcement officials, school administrators and teachers, code officials, and architects. Each party approaches the concept of 'safe' from varying institutional logics defined by their professional culture or place in society. Institutional logics represent frameworks for how people in society can frame an issue and help guide them to solve problems. These logics can be complementary or competing. One issue is finding common ground defining the problem and finding a common language with which stakeholders can communicate and work together. Another is understanding how practices and customs differ between stakeholders. Knowing how each party frames the issue of 'safe' or 'secure' schools' aids in finding solutions to impasses where logics conflict through more holistic definitions. It also allows us to empirically know varying approaches to problem solving and where research is being conducted on the issue. The American Institute of Architects has lobbied the US government to establish a "Safe Schools Clearinghouse". Conceived as a repository of best practices for 'safe' school design, this clearinghouse encourages experimental research by design schools. Research would be the foundation for decision-making by local school districts and would encourage the development of new technologies in school safety. However, there currently appears to be a lack of safety or security research within our architecture schools. To understand where academia is on the issue of school safety research, this paper explores, through a contemporary literature review, the areas of peer-reviewed research on four key terms: "safe schools", "school safety", "school security", and "school shootings". The results indicate that the topic of school safety is absent in architecture academia, and most prevalent in the fields of psychology and education. While there is much literature on school safety outside academia sharing ideas, opinions, and case studies of design practices, no rigorous research appears to be being conducted in our design schools offering the validity necessary to make prudent decisions. If architects are expected to act as arbiters of best practices to guide and educate society on the design of 'safe' schools, then research within our design schools must begin now.

Keywords: Safe schools, institutional logics, security, safety

INTRODUCTION

Safety and security demand architectural attention. We all share an interest in occupying spaces that are free from harm, whether intentional or accidental. Building codes demand our buildings be able to withstand fire and destructive natural forces, provide for the introduction of fresh air and clean water, and that waste be safely removed. Human-caused harm in the built environment is left unaddressed by our codes with the assumption that design has no impact on behavior. Although research has shown a connection between design and crime (Jeffrey 1971; Newman 1973; Crowe 2000), architects often leave the question of security to others who may have conflicting vested interests that can prove to be detrimental to the safe enjoyment of space. Without proper attention, the spaces we create can harbor feelings of unease and may breed illicit activity.

This paper aims to identify the various academic fields conducting research on issues of school safety and security. Through a methodical literature review process, various academic fields are investigated for research that has been conducted in the previous ten years. It is hoped that through this process we can learn where architecture stands among other academic fields, as well as how academic research writing compares to non-academic writing found in trade journals, newspapers, or professional magazines.

Understanding where architecture fits within the discussion allows us to identify other approaches and points of view on the issue. Because architectural projects involve a multitude of stakeholders, having a broader awareness of how other fields approach the issue allows for improved understanding and negotiation of disagreements in making decisions. Alternative approaches to the concepts of safety and security may hinder the ability to adequately implement effective solutions to safety and security problems. Physical or social science-backed research can help alleviate these differences and prepare the architect with solid evidence in support of an agreeable solution.

It also helps to advance the safety and welfare of clients and the public by providing a vital resource to those decision makers tasked with designing safe and secure learning spaces.

1. SAFETY OR SECURITY? IS THERE A DIFFERENCE?

1.1. DEFINING SAFETY AND SECURITY

What defines a school to be safe or secure? Is a safe school one in which no mass shootings occur but children are bullied or harassed on a regular basis? Is the absence of a mass shooting definitive of a 'safe' or "secure" school? If this were the case, any school suffering from mass shootings would have been "safe" the day before such events occurred. The terms safety and security are often used interchangeably because they are multidimensional in meaning. This usually isn't problematic but finding a clearer definition could be useful. Bucher and Manning (2005) have stated that defining a school to be safe or unsafe can be problematic. In order to measure how "safe" or "secure" a school is, working definitions should be developed so that concepts of safety or security can be operationalized.

According to Bucher and Manning (2005), "A safe school is one in which the total school climate allows students, teachers, administrators, staff, and visitors to interact in a positive, nonthreatening manner that reflects the educational mission of the school while fostering positive relationships and personal growth" (56). This definition identifies a wider understanding of safety that includes both physical and psychological factors. Safety for the purpose of this research is understood as that state of being protected from hurt or injury resulting from unintentional, non-human caused events. This is how our building codes address the protection of human life from events that may be natural, industrial in nature, or that result from accident. These events include earthquake, hurricane, or fire.

Security can be defined as a state where an individual is unthreatened by a violation of rights, including freedom from physical harm (by another) (OED). Security may also be defined as a psychological feeling of safety (OED). This second understanding of security addresses concerns of all students' right to freedom from abuse, either physical or verbal. Security, for the purpose of this research, is defined as protection against hurt or harm from human-caused intentional acts. Such acts may include mass shootings, bullying, or sexual assault. It does not include natural threats.

Considering the violence aspect of safety (or security) Mayer and Furlong (2010) state that there has been a lack of consensus on what constitutes school violence and disorder. Within the spectrum of school violence are multiple behaviors that have come in and out of inclusion. Astor, Guerra, and Van Acker (2010) have asserted that the scope of the term has expanded over the years and results in a "broader concept of school safety (69). Astor, Guerra, and Van Acker (2010) have identified behaviors included under the umbrella of school safety, as being also labeled aggression, bullying, and violence. These behaviors may also include verbal assaults or exclusion from social groups. Within the literature, safety has come to include such factors or issues as gun violence, bullying, fire, trauma (observing violence against others), fear of crime, equity and inclusion, sexual violence, suicide, terrorism, weapons, hazardous materials, gang activity, harassment, cybersecurity, or bomb threats.

For the purpose of this research, a safe school is defined as a place where children can learn free from violence and in an environment conducive to mental and physical wellbeing. As such, mental and physical wellbeing includes freedom from bullying that is both physical and psychological in its forms, allowing children to focus their attention on academic and personal growth. Such environments are welcoming, promote school identity, and are healthy climates for participation and growth.

1.2. CONFLICT AND INTERCHANGEABILITY OF TERMS

Safety and security can be understood to be distinctly different depending upon which stakeholder is discussing the issue of school safety. A law enforcement officer may view a safe school to be one free of weapons and drugs. A school psychologist may see safe schools as being those where students are free from mental stressors that impede their ability to interact with teachers and fellow students and foster a sense of belonging. For a building code official, a safe school is one with adequate egress and adequate building systems. Interchangeability of the terms safety and security can shift the concept of safety along a scale of pure safety and pure security, depending upon each stakeholder's sense of place within society and the dominant institutional logic they possess.

2. INSTITUTIONAL LOGICS

2.1. WHAT ARE INSTITUTIONAL LOGICS?

Stakeholders are members of various institutions who frame their understanding of issues through the practices and customs by which they approach tasks that influence individual and organizational behavior (Thornton, Ocasio, Lounsbury 2012, 2). Each stakeholder interested in safe schools approaches the issue from

their unique institutional logic. Institutional logics, as defined by Friedland and Alford (1991), as cited by Berg Johansen and Waldorf (2017) are "A set of material practices and symbolic constructions [that] constitute organizing principles for supraorganizational patterns of human activity" (248). Berg Johansen and Waldorff (2017) describe institutional logics as "Sets of symbolic meaning and practices which coexists and create friction and actors' perceptions of social reality (11).

Berg Johansen and Waldorff (2017) state that institutional logics guide and are guided by institutional orders designated as market, corporation, profession, state, community, family, and religion. Institutional logics represent a framework for the ways in which we approach problems based on our own customs, education, membership in different groups, and generally define our motivations and reasoning behind those. These motivations and reasonings can be vastly different depending upon the basic institutional orders we occupy. Often, these various logics can lead stakeholders to resist seeking other opinions believing they are uniquely suited to solve the problem. Rather than working in collaboration, institutional logics can create barriers to developing more holistic solutions. However, they can also provide alternative perspectives in developing solutions. This is where leadership in creating innovative solutions is useful.

Orders present among interested stakeholders of safe schools include profession (architects, engineers, teachers, and psychologists), state (school administrators, law enforcement, code officials, and the Fire Marshall), corporation (district), community (tax payers and concerned citizens), family (parents and siblings), and market (building material vendors and security consultants). Many stakeholders exist within multiple orders, such as architects as professionals, business owners, parents, and members of the community. Which order dominates can vary. Many of the parties within these orders may have conflicting approaches to solving the problem of ensuring a safe and healthy place to learn. Where friction occurs between orders, there is opportunity for innovation. However, sometimes these frictions are the result of impassable conflict. A lack of understanding of logic perspectives can delay a project or lead to animosity.

2.2. FRICTIONS BETWEEN LOGICS PRESENT IN SCHOOL SAFETY AND SECURITY

A market order that seeks to maximize profit by providing a good that satisfies a perceived need of the school district can conflict with a state order of enforcing the building code if such a product interferes with egress. For example, in the case of a security lockdown, a more robust locking mechanism might enhance security, but may degrade safety through impeded egress. Security surveillance systems may offer greater physical security but may negatively impact the psychological wellbeing of students. Security features in the physical environment can be associated with undesirable effects on students (Schreck and Miller 2003). These features include metal detectors, cameras, locked doors, hall monitors, and security personnel. Lamoreaux (2017) found negative effects associated with metal detectors including increased fear of crime, that metal detectors are associated with increased student concern for their safety, that student fears are compounded with the addition of increased security measures (Perumean-Chaney and Sutton 2013), and that students at schools with metal detectors feel significantly less safe than students at schools without them (Gastic 2011; Hankin, Hertz, Simon 2011). A school psychologist might disagree that such effects provide an increase in safety given the psychological discomfort they bring. School psychologists lie within a profession order. In this scenario the market and profession orders clash.

2.3. THE ARCHITECT'S ROLE

Architects are well situated to moderate such conflicts for innovative solutions because they are involved with many of the stakeholders across the entire breadth of a school building project. Through the management of their design projects, they interact with many of the stakeholders and can inform others through such actions as participatory design and other predesign efforts. Through their design creativity they can offer innovative solutions for satisfying conflicting orders providing new pathways for safety in school design. Among those involved in the process of implementing a school building project it is likely that architects are best suited for moderating such conflicts. Understanding the various perspectives on 'safety' helps the architect to navigate competing orders and inform others of what drives their agendas. Helping to mediate differences provides for a better design project fulfilling more of the stakeholders' needs and a better place to learn and grow. Rigorous research on safety and security issues provides the architect with the tools to help negotiate effective solutions.

3. DESIGN RESEARCH ON SCHOOL SAFETY AND SECURITY

3.1. WHY IS DESIGN IMPORTANT FOR SCHOOL SAFETY?

There are many reasons why safety and security research are important to the field of architecture. Firstly, we know that design and manipulation of the

environment has an impact on human behavior (Kopec 2006; Bechtel 1997). Research shows that design has significant effects on academic performance. Tanner (2009) finds that variations in movement and circulation patterns significantly influences reading comprehension, language arts, mathematics, and science scores. Patterns of views significantly influence reading vocabulary, language arts, and mathematics. Wolhill and Van Vliet (1985), as cited by Tanner (2009), find a relationship between crowded learning spaces and student outcomes. Physical comfort factors of a school design can be positively or negatively correlated with performance, but other factors of design, which Schabmann et al. (2016) have deemed symbolic conditions, may as well. These symbolic conditions include overall appearance, classroom layout, objects, décor, complexity, and a variety of activities occurring within a space.

Crime Prevention Through Environmental Design (CPTED) has had mixed results in terms of associating the design of space (architectural, urban, and landscape) with reduction in crime (Taylor 2002), however, there is research that supports the assertion that design can remove opportunity for illicit behavior. Much empirical evidence exists on the design-crime link, and according to Taylor (2002), the theoretical bases for CPTED lies in a rational offender perspective, a behavioral geography perspective, and a routine activities perspective. A main insight developed by Lamoreaux (2017) is the link between CPTED strategies and the psychological wellbeing of students. Citing Skiba et al. (2004), Lamoreaux indicates that "Based on current findings, school connectedness and positive climate may contribute to school safety as much as physical security measures do" (27).

The notion that design can negatively affect behavior is supported by Fram and Dickmann (2012), who conclude that if a tendency for bullying and peer harassment is present, then that behavior can be exacerbated by specific elements of the built environment. They argue that the built environment can be a contributing factor in a school's bullying problem. Per Astor and Meyer (1999), "A recent study conducted by the authors of this article suggested that violence involving females in schools occurred in predictable school locations, at predictable times of the day, and with predictable sets of social circumstances associated with the school setting" (201-202).

School spaces can develop patterns of behavior associated with bullying, harassment, assault, theft, smoking, etc. Safety extends beyond the exceptionally rare events of mass shootings and is most affected by occurrences that impact every school, every day. If schools are to be thriving, viable places, they must do more than provide protection from fire and earthquakes. They must be places where children find connectedness, a sense of belonging, and freedom from abuse or harassment.

Secondly, lack of academic research inhibits architects' abilities to make sound, science-backed decisions and this prevents them from possessing the necessary knowledge-base or data needed to support those decisions when challenged by stakeholders. As Thomas Fisher (2017) of the University of Minnesota notes, "Research has become critical to twenty-first century architectural practice. The more unanswered questions we have regarding the rapidly evolving world around us, the more we need research to help us answer them" (131).

Fisher (2017) also states that "Research leads to generalizable results that pertain to more than one instance or setting" (132).

Thirdly, there is great social and political pressure to reduce school violence. Many opinions and theories exist about the causes of violence in schools. Other fields such as education, psychology, and criminology are conducting the bulk of the research found in this literature review, and those findings are being applied to change educational practice. Solid research can potentially reduce knee-jerk reactions and decision-making that erodes civil liberties such as Second, Fourth, and Sixth Amendment rights.

Lastly, there is a call from both the state (federal and state governments) and the professions to conduct rigorous research on school safety and security. A recent legislative proposal, the School Safety Clearinghouse Act (S.2530 2019), hereafter referred to as The Act, calls upon institutions of higher education and design schools for input, and seeks "well-designed and well-implemented experimental study" (4).

Outside of academia, professional working groups such as the American Institute of Architects' (AIA) Committee on Architecture in Education (CAE) gather to discuss best practices and innovations in learning environment design (AIA 2019). The American Society of Industrial Security's (ASIS) School Security and Safety Council (SSSC) and the Security in Architecture and Engineering Council (SAEC) work to educate building owners, facility managers, and design professionals how to create safer learning environments (FSD 2020). The Association for Learning Environments (A4LE) also strives to improve best practices through its efforts in annual conferences. The Education Market Association trade group (EDmarket 2020), representing manufacturers, distributors, and service providers in education, also work towards providing solutions to safety and security problems. Both the A4LE and EDmarket groups work with the AIA to jointly educate

AIA members in designing better learning environments (Ed-Spaces 2018; LearningSCAPES 2019). The CAE publishes the research journal, Dialogues (CAE 2017), that addresses numerous topics related to school performance and the articles contained within do cite other peer-reviewed research. However, concerning school safety and security, none of the fourteen articles contained within the three annual publications addresses this topic.

3.2. HOW CAN ARCHITECTS RESPOND TO THE PROPOSED SCHOOL SAFETY CLEARINGHOUSE ACT?

The Act (S.2530 2019), mentioned above, directly challenges the architecture profession to contribute or recommend best practices in school design. The stated purpose of this Act is to require the Secretary of Homeland Security to establish a School Safety Clearinghouse. This clearinghouse would act in part as a central hub for best practices and case studies, review school safety recommendations by design professionals, and seeks to partner with organizations such as the AIA to provide training and technical assistance. This Act recognizes the importance of the architecture profession and the design schools in helping to solve the problems of bullying and violence within our schools. If enacted, schools of architecture would have a new avenue for grants to conduct cutting edge research in a neglected field of study.

4. A REVIEW OF SCHOOL SAFETY & SECURITY LITERATURE

4.1. IDENTIFYING INTERESTED STAKEHOLDERS

This research seeks to determine which stakeholders in society are most actively researching issues of school safety and security by searching available literature for the prevalence of subjects as defined by the nature of the journals in which these articles or books appear. The literature search aims to identify and collect as many relevant articles and books that specifically use the term 'safe schools', 'school safety', 'school security', and 'school shootings'. An examination of the journal titles will reveal in which fields discussions are occurring.

4.2. METHODOLOGY

The four terms of 'safe schools', 'school safety', 'school security', and 'school shootings' were searched within the Penn State University library's online system, which allows for searches of electronic resources available to students, including databases based on discipline such as architecture, criminal justice, education, etc. On the advice of a university librarian, I searched databases relevant to the issues of school safety or security. This process produces reference lists for each search term, and each list is exported for later use in EndNote, a reference management software. Each database's search results are saved as individual files labeled according to the search term. Many databases are excluded for lack of relevance. In total there are sity-seven relevant databases. Under each search term and relevant database, results are identified. The numbers in Table 2 below represent the number of useful or relevant articles within the total number provided by the search engine for both peer-reviewed/academic and non-peer reviewed/non-academic sources. For example, within the Art Full Text & Art Index Retrospective database, under the search term "School Safety", only three of the twenty-seven article results provided are relevant to the discussion.

Reasons for irrelevance include a different application or definition of the term safety. My research involves the mitigation of violence in school settings, so an example of irrelevance might be an article about laboratory safety, sports injuries, or bus transportation safety. Also, databases contain key phrases hidden within metadata that may not be located within the articles themselves, making them irrelevant. What is determined to be relevant is admittedly subjective as many of the databases have different options available for inclusion and have their own algorithms for inclusion. Some databases are excluded for lack of any filtering capabilities, making the task of identifying relevant articles overly burdensome.

The literature review is generally conducted according to a methodology developed by Warnes (2018) in his research paper entitled *Conducting a Literature Review Using NVivo*. Warnes developed his method as part of his literature review for his Ph.D. research on concepts of 'teaching excellence'. NVivo is a qualitative data analysis (QDA) computer software program produced by QSR International. It is designed to analyze mixed-methods data and can be used to find patterns across multiple media and sources. Researchers can encode text within articles and deep analysis allows a researcher to find patterns within articles, books, interviews, etc. to help discover gaps in research. Warnes (2018, 3-4) developed the following ten stages in his research paper:

Stage 1: Searching
Stage 2: Coding (reference lists)
Stage 3: Tidying
Stage 4: Sorting
Stage 5: Collecting
Stage 6: Categorizing
Stage 7: Naming
Stage 8: Cross-Referencing
Stage 9: Thematic Coding
Stage 10: Meta-Analysis

Each term is searched within the databases in advanced search mode using the exact phrases listed. The searches are limited to most recent research (2009-2019). Search results are limited to peer-reviewed when the option is available, so that it only reflects academic work to gain an understanding of the prioritization of these terms in academia. Searches are filtered for English-language only, and, where possible, limited to the geographic area of the United States.

Articles for inclusion are limited to those with the specific term in the title or the abstract. Searches for the terms anywhere in the text are avoided to prevent inclusion of an article that substantially addresses a different subject, but may include the term in an unrelated way. Each database provides a varying number of results. These are manually scanned for relevance. This scanning is somewhat subjective and often based on intuition or filtering where automatic filtering may have failed to omit unwanted results, such as articles outside the US. Using the web browser's "find" feature quickly identifies search terms within titles and abstracts. Not all articles have abstracts available for review.

Searching for these four terms presents some issues. Many of the database providers, such as ProQuest, have multiple databases available within them. For example, there are the ProQuest ERIC and ProQuest PsychArticles databases, which simply divide articles into different topics, but were also included in the all-encompassing ProQuest search. Independent searches within each individual database helps provide as many directions from which to find the relevant literature. There is a great deal of overlap between databases and duplicate articles are deleted. The process of deletion is based upon retaining as much bibliographic information as possible and identical articles with DOI numbers and abstracts were prioritized for search capabilities and for convenience of gathering articles for future analysis. Not all articles are able to be downloaded through the university or inter-library loan system. Results of the collection and filtering processes are shown in Table 1.

Once Adobe Acrobat PDF files of the articles/books are collected, they are renamed according to a convention suggested by Warnes (2018). This is: date_year_filename.pdf. The file naming conventions provided by the databases vary greatly so this process makes articles easier to retrieve for analysis. These files are then imported into NVivo for a cursory analysis of the specific search terms in titles, abstracts, and associated PDF files. Here the search of the four terms is expanded to include text within the associated PDF files. This may present a methodology problem as the database filtering is limited to titles only, and then expanded to all content within those limited number of references. The purpose of the initial filtering is to reduce the references to only those whose authors deemed the search terms important enough to include within titles or abstracts. Given the approximately 2,700 articles referenced after duplicates are omitted, collection of PDFs requires significant time. Further analysis of this methodology is prudent. The types of journals and the top twenty most frequent words of six letters or more found in all documents, titles, and abstracts are identified. Figures for each search term are shown in table 2 below, and the resulting frequency of words and journal titles are found in figures 1 through 8.

4.3. RESULTS

This paper is intended to serve as a launching point for a literature review of the academic work involving the concepts of school safety and security, as part of my Ph.D. dissertation in how design might be a mitigating factor for school violence, a poor school climate, and lower academic performance. In order to identify gaps within the literature, and more specifically where the architecture profession and design schools might conduct research on an important social phenomenon, the first stage is to gain a sense of contemporary research, and what the role of architecture might be. Table 2 represents the results of the search.

	Search Term			
	"Safe Schools"	"School Safety"	"School Security"	"School Shootings"
Initial total references	717	2164	584	1296
After duplicate references removed	589	1045	367	731
References with search term in title only	39	133	45	117
Articles collected for analysis	33	99	29	85

Table 1: Reference Search and Duplicate Article Deletion Results. Source: (Author 2020)

		Search Term							
Subject/Field	Database	"Safe Schools"		"School Safety"		"School Security"		"School Shootings"	
		PR/A	NPR/NA	PR/A	NPR/NA	PR/A	NPR/NA	PR/A	NPR/NA
Art and Architecture	Art Full Text & Art Index Retrospective	2/6	10/26	3/27	12/14	0/0	6/6	0/0	12/47
	Avery Index	0/0	0/0	0/0	0/0	0/0	1/1	0/0	0/0
	EBSCO-Film & Television	0/1	1/1	0/0	1/1	0/0	2/2	3/4	38/38
	EBSCO-Arts & Humanities Index	1/1	0/0	1/4	0/0	0/0	0/14	8/8	8/12
	Taylor & Francis – Arts	1/5	□	6/8	□	0/4	□	6/33	□
	Taylor & Francis – Built Environment	3/5	□	3/10	□	2/3	□	0/1	□
	Web of Science Arts & Humanities	0/1	□	1/2	□	0/0	□	3/4	□
Criminal Justice	Annual Reviews	1/2	□	1/3	□	1/3	□	1/3	□
	Congressional Research Service Reports (CRS)	0/0	89	6/8	218,810	1/1	270,101	1/1	7,406
	CQ Researcher	1/8	□	7/11	□	3/15	□	9/22	□
	EBSCO Academic Search Complete	6/7	34/56	31/74	121/121	12/17	73/73	18/29	149/149
	EBSCO-Criminal Justice Abstracts	29/49	2/2	4/5	81/122	11/22	66/90	10/16	46/71
	PolicyFile	□□	0/3	□□	13/14	□□	1/1	□□	3/3
Education	ProQuest Doctoral Dissertation	1/1	□	47/110	□	18/18	□	12/14	□
	JSTOR - Education	49/245		88/403		38/95		11/294	
	ProQuest-ERIC	39/39	28	145/147	424	28/28	75	54/61	7
	ProQuest PsychArticles	1/1	□	7/7	□	0/0	□	2/4	□
	Sage Research Methods	4/9	□□□	7/18	□□□	1/2	□□□	8/24	□□□
	Sage Knowledge	□□	39/89	□□	99/185	□□	36/128	□□	125/381
	Taylor & Francis – Education	10/11	□	80/499	□	19/86	□	31/176	□
	EBSCO-ERIC	21/25	0/0	95/100	0/0	30/32	0/0	38/44	0/0
Security Issues	Homeland Security Digital Library (HSDL) - Theses and Research reports	8/18	□	15/37	□	14/21	□	19/66	□
	HSDL - Journals and Articles	□□□□	1/13	□□□□	6/38	□□□□	0/10	□□□□	4/37
	Praeger Security International	0/0	0/1	0/0	0/1	0/0	0/0	0/0	0/4
	ProQuest-Risk Abstracts	2/2	0/0	7/13	0/0	1/1	0/0	5/6	0/0
Law	HEIN Online	5/8	□	7/23	□	3/6	□	9/10	□
	EBSCO Host Legal Periodicals and Books	6/81	1/2	17/153	4/5	10/76	3/5	16/117	10/18
	ProQuest Regulatory Insight	□□	14/23	□□	5/71	□□	0/17	□□	0/12
Philosophy	PhilPapers	□□□□	1/3	□□□□	0/4	□□□□	0/0	□□□□	17/17
	Philosopher's Index	1/1	0/1	1/1	0/1	0/0	0/0	2/2	1/2
Political Science	EBSCO America History	0/0	0/3	2/4	0/0	0/0	0/0	5/12	1/2
	Gale Virtual Reference Library	5/5	219	35/35	109	8/8	26	50	159
	EBSCO-Peace Research	0/3	0/0	2/2	0/0	1/2	1/2	1/2	9/14
	Penn State Electronic Theses and Dissertations (Political Science)	0/1	□	1/1	□	1/1	□	3/4	□
	Web of Science (Political Science)	40/67	□	185/309	□	37/47	□	133/178	□
Psychology	ProQuest Dissertations and Theses (psychology only)	3/3	□	32/62	□	7/19	□	23/31	□
	ProQuest Nursing and Allied Health	95/132	11/22	182/277	44/46	23/37	3/3	106/145	1/1
Health	EBSCO-CINAHL	4/7	19/19	41/44	1/1	6/7	0/2	19/20	28/28
	EBSCO-Health & Psychosocial Instruments	0/0	□	0/0	□	0/0	□	0/0	□
	EBSCO-Health and Safety Science Abstracts	0/0	0/1	7/7	0/4	1/1	0/0	1/1	0/0

Social Science	EBSCO- Race Relations	1/3	0/0	12/12	0/0	7/7	0/0	1/3	0/0
	ProQuest (all databases)	0/3	2,367	88/355	16,694	28/46	4,238	6/10	9,975
	ProQuest Sociological Abstracts	2/2	2/2	67/129	1/1	6/8	1/1	3/4	0/1
	Social Sciences Citation Index	□□	25/38	□□	215/279	□□	/3544	□□ 80/128	90/137
Structural Design/ Construction Engineering Technology	EBSCO - Business Source Premier (Engineering)	5/10	5/5	14/27	/271	4/7	/138	23/37	/850
	Compendex- Engineering Village 2	2/12	0/0	1/4	0/0	5/11	0/14	8/13	8/12
	ProQuest-Dissertations & Theses A&I	1/1	□	4/14	□	1/1	□	1/3	□
	Taylor & Francis – Engineering and Technology	2/11	□	0/31	□	2/4	□	0/3	□
Women’s, Gender & Sexual Studies	JSTOR-Feminist, Gender, and Women’s Studies	□	2/5	□	5/10	□	0/1	□	6/8
	LGBT Thought & Culture	□	0/0	□	0/0	□	0/0	□	0/0
	EBSCO-LGBT Life	12/13	31/32	8/9	15/16	0/0	2/2	0/0	6/6
	EBSCO-Women’s Studies International	0/1	1/1	3/4	1/1	0/0	0/0	8/12	1/1
American Studies	EBSCO-Communication & Mass Media	0/1	0/0	3/5	4/4	0/0	2/2	5/6	2/9
	JSTOR-American Studies	□	2/2	□	5/5	□	0/0	□	7/7
Business & Economics	ABI/INFORM	0/2	11/12	22/28	225/227	2/2	76/76	1/1	247/247
	Business Source Premier	2/3	5/5	22/28	23/23	2/2	17/17	1/1	56/133
	EBSCO-EconLit	□□	0/0	□□	3/3	□□	0/0	□□	2/2
History	EBSCO-American History and Life	0/0	0/0	3/4	0/0	0/0	0/0	2/2	1/2
	EBSCO-Historical Abstracts	0/0	0/0	1/2	0/0	0/0	0/0	2/4	0/0
Misc./ General	Brill Online Books and Journals	□□	0/0	□□	0/0	□□	0/0	□□	0/0
	EBSCO-Academic Search Alumni	4/5	13/13	16/23	108/108	8/8	68/68	28/32	145/145
	EBSCO-Ageline	0/0	0/0	1/1	0/0	0/0	0/0	0/0	0/0
	EBSCO-Anthropology Plus	□□	0/0	□□	0/1	□□	0/4	□□	0/1
	EBSCO-eBook Collection	0/0	1/1	0/0	2/2	0/0	0/0	0/0	0/1
	EBSCO-GeoRef	0/0	0/0	0/1	0/0	0/0	0/0	0/0	0/0
	EBSCO-GeoRef in Process	0/0	0/0	0/1	0/2	0/0	0/0	0/0	0/0
	EBSCO-Library, Literature, and Information Science Index	0/0	0/0	0/0	1/1	0/0	0/0	1/1	11/14
	EBSCO-Library, Information Science, & Technology Abstracts	0/0	0/0	1/1	2/2	0/1	1/2	1/1	14/17
	EBSCO-MLA International Bibliography	0/0	0/0	1/1	0/0	0/0	0/0	2/2	0/0
	EBSCO-Open Dissertation	2/9	□	34/54	□	4/4	□	18/24	□
	Scopus	□□	111/112	□□	236/236	□□	49/49	□□	199/223
Environmental	EBSCO-GreenFILE	0/2	0/0	1/1	2/2	1/1	0/0	0/0	1/1

□	Non-academic or non-peer reviewed sources are unavailable.
□□	Peer-reviewed option is unavailable.
□□□	Peer-reviewed option is unavailable, but results are peer-viewed or in an academic journal.
□□□□	Some content is peer-reviewed.
PR/A	Peer-reviewed or found in academic literature.
NPR/NA	Non-Peer Reviewed or non-academic.

Table 2: Database Search - Relevant results per total search hits returned. Source: (Author 2020)

A search for most common words contained within found articles, under each search term, shows the following:

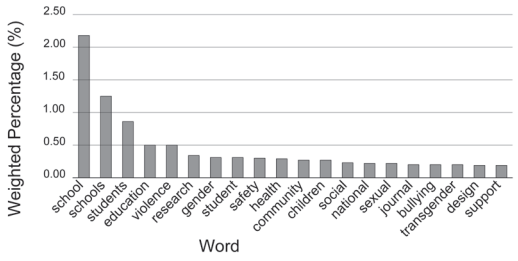

Figure 1: Twenty most frequent words found within titles, abstracts, and bodies of 'Safe Schools' literature reviewed. (Author 2020)

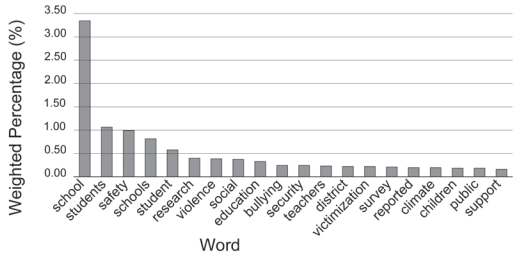

Figure 2: Twenty most frequent words found within titles, abstracts, and bodies of 'School Safety' literature reviewed. (Author 2020)

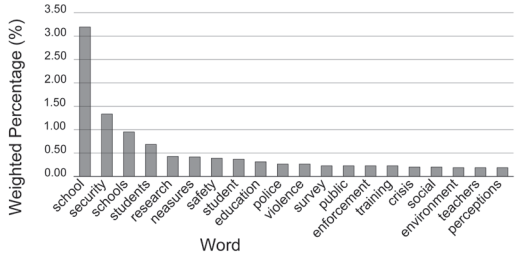

Figure 3: Twenty most frequent words found within titles, abstracts, and bodies of 'School Security' literature reviewed. (Author 2020)

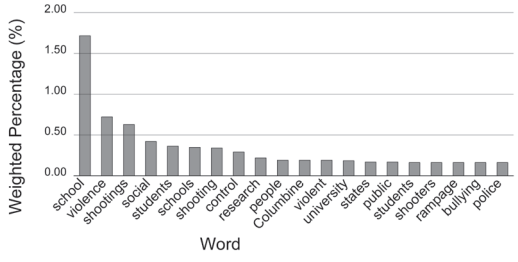

Figure 4: Twenty most frequent words found within titles, abstracts, and bodies of 'School Shootings' literature reviewed. (Author 2020)

Under all four search terms the word design is absent except for "safe schools", where it ranks 19th.

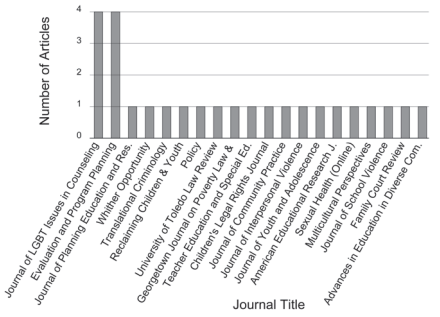

Figure 5: Most frequent journals containing the term 'Safe Schools' in the literature reviewed. Source: (Author 2020)

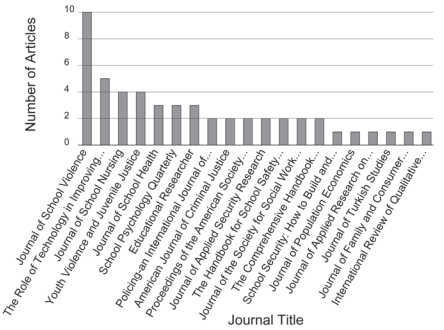

Figure 6: Most frequent journals containing the term 'School Safety' in the literature reviewed. Source: (Author 2020)

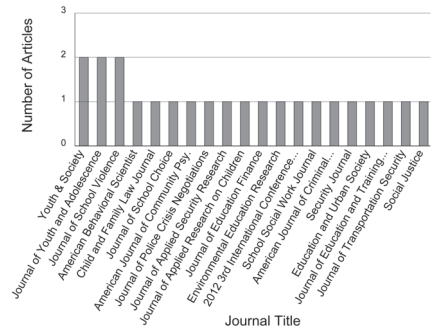

Figure 7: Most frequent journals containing the term 'School Security' in the literature reviewed. Source: (Author 2020)

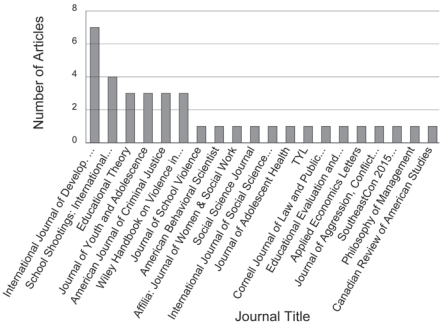

Figure 8: Most frequent journals containing the term 'School Shootings' in the literature reviewed. Source: (Author 2020)

The most frequent journal titles found in the literature review, identified in figures 5-8, illustrate that the predominance of school safety and security research is unrelated to design or architecture. Given the call for more research from within the profession, this is surprising. What is evident is the difference between academic and non-academic writing. Non-academic professional journals in architecture containing articles about safety and security include *Architectural Record, Architect, Architectural Design, Domus,* and the *RIBA Journal*. Sample articles include *Safe Havens* (Logan 2017), *Tackling Safety Through Design* (Kaiser 2013), and *The Need to Lead in School Design* (Cimino 2018). While these articles discuss the seriousness and desire to solve the problems related to the issue, they do not cite any research that serves as a foundation for prudent decision making. The trade and professional articles generally reflect consensus opinion or common practice within the profession. Outside of architecture, journals include *Landscape Architecture, Art Newspaper, Arts in Psychotherapy,* and *International Design*. Trade journals including *Security Design Management (ASIS), Entertainment Up-Close,* and *Tech & Learning* have written about issues of school safety and security.

CONCLUSION

What is evident from this literature search is that the academic field of architecture is not conducting research on issues of safety and security in school environments, as other fields are. Fields, such as psychology, gender studies, education, and criminology, address safety and security from a broad and holistic perspective. Within psychology research, the role of architecture in the safety and security of school environments has been explored (Lamoreaux 2017). This research supports the impact architecture has on the psychology of those who occupy the spaces we design. Research by Walton (2011) in the field of education addresses physical design in safe school environments. Given that approximately 20% of the US population is in a school each weekday, it is prudent to conduct research on such spaces and the impact design has on school safety and security. Moore and Lackney (1993) have investigated a rethinking of the design of learning spaces in order to improve a sense of community and improving school climates. Practitioners such as Nair (2017) have promoted new approaches to the design of learning spaces arguing, "School building design can be a very significant and often overlooked force in creating a positive school climate" (13). As Scott-Webber (2004) notes, "The large body of environment/behavior research affirms the importance of the relationship between human behavior and the physical environment, it enables the production of environments supporting intended behaviors, and defines major components of these behaviors" (5).

The literature review reveals that stakeholders who desire to keep schools safe are overwhelmingly non-designers. If the design of the built environment has an impact on people's physical and psychological wellbeing, then wouldn't architects have useful input in the research of how to design school spaces so that they may become safer places to learn? Given the vast number of financial resources devoted to keeping schools safe, sound research on how the design of a school can impact safety is warranted so that the negative effects of certain interventions don't dominate (technological such as: surveillance or metal detectors and human such as armed school resource officers or armed teachers). Much effort is put into these non-architectural strategies with little to no empirical data to support such efforts. On the contrary, many of these solutions have shown to negatively impact learning.

Future useful research on this topic might include: completion of Warnes (2018) methodology for deep analysis of the collected articles, a closer examination of the non-academic literature to determine where attention is centered and a closer look at why schools of architecture are not emphasizing the environment-behavior connection within their curricula through the provision of either core courses or electives. A review of NAAB accredited programs by this author reveals that only 13.7% architecture schools provide an environment-behavior related course within their school, in various degree programs such as architecture, interior design, or environmental design; of the 138 accredited schools examined, only 7.2% offered an environmental psychology course.

Architectural research into safer and more secure school design can provide the basis that affords architects the ability to help school administrators make the right decisions. When we think about the various stakeholders and the institutional logics behind why and how they attempt to achieve the same goal, empirical data can bridge the gap between differing opinions. School board members are beholden to those who vote for them, law enforcement officers to their professional sense of duty, school counselors to the students they guide, and architects to a sense of professional ethics, duty, and desire to make a profit. With adequate research to support the work, an architect can navigate disagreements and unsubstantiated opinions in search of compromise and even innovation. Research arms the architect against stakeholders whose tradition, opinion, and motivations are driven by their own particular institutional logics. Research also allows for innovation as friction between logics has often led to changes

in the building code providing owners, contractors, occupants, and code officials what they request, but from a new direction.

Safety and security in school environments requires the architecture field become an active participant ensuring the betterment of students' experiences and academic development. Given the lack of architectural research shown above, and the desire by political leaders and the architecture profession to work on real evidence-based solutions, there is an opportunity for the design schools to pave the way for valuable research.

REFERENCES

A4LE (Association for Learning Environments). 2020. "Mission and Vison". Accessed February 9, 2020. https://www.a4le.org/A4LE/About/A4LE/About/About.aspx

AIA (American Institute of Architects). 2019. *Conference Report - The Design of Safe, Secure & Welcoming Learning Environments: Hosted by the Committee on Architecture for Education*. Accessed February 9, 2020. http://content.aia.org/sites/default/files/2019-09/CAE_Report_v7_FINAL_interactive.pdf

Astor, R. A., N. Guerra, and R. Van Acker. 2010. "How Can We Improve School Safety Research?" *Educational Researcher 39*, no.1: 69-78. http://dx.doi.org/10.3102/0013189X09357619

Astor, R. A. and H.A. Meyer. 1999. "Where Girls and Women Won't Go: Female Students', Teachers', and Social Workers' Views of School Safety." *Children & Schools* 21, no. 4: 201-219. doi:10.1093/cs/21.4.201

Bechtel, Robert B. 1997. *Environment & Behavior: An Introduction*. Thousand Oaks: Sage Publications.

Berg Johansen, C., and S.B. Waldorff. 2015. "What are Institutional Logics-and Where is the Perspective Taking Us?" *Academy of Management Proceedings* 2015, no. 1, 14380. Briarcliff Manor, NY 10510: Academy of Management. DOI:10.5465/ambpp.2015.14380abstract

Bucher, K. T. and M.L. Manning. 2005. "Creating Safe Schools." *The Clearing House: A Journal of Educational Strategies, Issues and Ideas* 79, no.1: 55-60. DOI:10.3200/TCHS.79.1.55-60

CAE (Committee on Architecture in Education). 2017. "Dialogues." Accessed February 9, 2020. https://pubs.royle.com/view/designquest-media/learning-by-design/dialogues-fall-2017

Cimino, Steve. 2018. "The Need to Lead in School Design." *Architect* 107, no. 9: 73. http://search.ebscohost.com.ezaccess.libraries.psu.edu/login.aspx?direct=true&db=buh&AN=133819904&site=ehost-live&scope=site.

Crowe, T. D., and National Crime Prevention Institute (University of Louisville). 2000. *Crime Prevention Through Environmental Design: Applications of Architectural Design and Space Management Concepts* (2nd ed.). Boston: Butterworth-Heinemann.

"EDmarket: About Us." Education Market Association. Accessed February 9, 2020. http://www.edmarket.org/aboutus/

"ED-Spaces: Architects, Designers, Facility Planners & Professional Firms." ED-Spaces 2018. http://www.ed-spaces.com/attendees/architects-designers/

"Facility Security Design (FSD)." ASIS International. Accessed February 09, 2020. https://www.aEsisonline.org/professional-development/asis-contract-learning/facility-security-design/

Fram, S. M. and E.M. Dickmann. 2012. "How the School Built Environment Exacerbates Bullying and Peer Harassment." *Children, Youth and Environments* 22, no. 1: 227-49. doi:10.7721/chilyoutenvi.22.1.0227.

Fisher, Thomas. 2017. "Research and Architecture's Knowledge Loop." *Technology|Architecture + Design* 1, no. 2: 131-134. doi:10.1080/24751448.2017.1354601

Friedland, R. and R. Alford. 1991. "Bringing Society Back In: Symbols, Practices, and Institutional Contradictions." In *the New Institutionalism in Organizational Analysis*, edited by W. Powell, & P. Dimaggio, 232-263. Chicago: University of Chicago Press.

Gastic, B. 2011. "Metal Detectors and Feeling Safe at School." *Education and Urban Society* 43, no. 4: 486-498. DOI:10.1177/0013124510380717

Hankin, A., M. Hertz, and T. Simon. 2011. "Impacts of Metal Detector Use in Schools: Insights From 15 Years of Research." *Journal of School Health* 81, no.2: 100-106. DOI:10.1111/j.1746-1561.2010.00566.x

Jeffery, C. R. 1971. *Crime Prevention Through Environmental Design*. Beverly Hills: Sage Publications.

Kopec, D. A. (2006). *Environmental Psychology for Design*. New York. Fairchild Publications Inc.

Lamoreaux, D. 2017. "Student Preferences for Safe and Psychologically Comfortable School Facilities." PhD diss., University of Arizona. https://repository.arizona.edu/handle/10150/626658

LearningSCAPES 2019. "Electronic Conference Program." Accessed February 09, 2020. https://learningscapes2019.a4le.org/

program/mobile/index.html

Logan, Katharine. 2017. “Safe Havens.” *Architectural Record* 205, no. 1: 112–18. http://search.ebscohost.com.ezaccess.libraries.psu.edu/login.aspx?direct=true&db=buh&AN=120637830&site=ehost-live&scope=site.

Kaiser, Laura Fisher. 2013. “Tackling Safety Through Design.” *Architectural Record* 201, no. 3: 38. http://search.ebscohost.com.ezaccess.libraries.psu.edu/login.aspx?direct=true&db=buh&AN=86453826&site=ehost-live&scope=site.

Mayer, M. J. and M.J. Furlong. 2010. “How Safe Are Our Schools?” *Educational Researcher* 39, no.1: 16-26. http://dx.doi.org/10.3102/0013189X09357617

Moore, G. T., and J.A. Lackney. 1993. “Design Patterns for American Schools: Responding to the Reform Movement.” Accessed October 3, 2019. https://eric.ed.gov/?id=ED375515

Nair, P. 2017. *Blueprint for Tomorrow: Redesigning Schools for Student-Centered Learning*. Cambridge: Harvard Education Press.

Newman, Oscar. 1973. *Defensible Space: Crime Prevention through Urban Design*. New York: Collier Books.

Perumean-Chaney, Suzanne and Lindsay M. Sutton. 2013. “Students and Perceived School Safety: The Impact of School Security Measures.” *American Journal of Criminal Justice: AJCJ* 38, no. 4 (December): 570-588. https://doi.org/10.1007/s12103-012-9182-2

Safe Schools Clearinghouse Act, S.2530, 116th Cong. (2019). https://www.congress.gov/116/bills/s2530/BILLS-116s2530is.pdf

Schabmann, A., V. Popper, B.M. Schmidt, C. Kühn, U. Pitro, and C. Spiel. 2016. “The Relevance of Innovative School Architecture for School Principals.” *School Leadership & Management* 36, no. 2: 184-203. https://doi.org/10.1080/13632434.2016.1196175

Schreck, Christopher J. and J. Mitchell Miller. 2003. “Sources of Fear of Crime at School: What is the Relative Contribution of Disorder, Individual Characteristics, and School Security?” *Journal of School Violence* 2, no. 4: 57-79. DOI: 10.1300/J202v02n04_04

Scott-Webber, Lennie. 2004. *In Sync: Environmental Behavior Research and the Design of Learning Spaces*. Ann Arbor: Society for College and University Planning.

“security, n.”. OED Online. December 2019. Oxford University Press. https://www-oed-com.ezaccess.libraries.psu.edu/view/Entry/174661?redirectedFrom=security (accessed February 09, 2020).

Skiba, R., A.B. Simmons, R. Peterson, J. McKelvey, S. Forde, and S. Gallini. 2004. “Beyond Guns, Drugs and Gangs: The Structure of Student Perceptions of School Safety”. *Journal of School Violence* 3, No. 2: 149-171. DOI:10.1300/J202v03n02_09

Tanner, C. K. 2009. “Effects of School Design on Student Outcomes.” *Journal of Educational Administration* 47, no. 3: 381-399. DOI:10.1108/09578230910955809

Taylor, Ralph B. 2002. “Crime Prevention Through Environmental Design (CPTED).” In *Handbook of Environmental Psychology*, edited by Robert B. Bechtel and Arza Churchman, 413-426. New York: John Wiley & Sons, Inc.

Thornton, P. H., W. Ocasio, and M. Lounsbury. 2012. *The Institutional Logics Perspective: A New Approach to Culture, Structure and Process*. Oxford: Oxford University Press.

Walton, R. H. 2011. “Physical Designs for Safe Schools.” PhD diss., Virginia Tech. https://vtechworks.lib.vt.edu/handle/10919/40397

Warnes, M. 2018. *Conducting a Literature Review using NVivo*. ResearchGate. https://www.researchgate.net/publication/327117399_Conducting_a_Literature_Review_using_NVivo. DOI 10.13140/RG.2.2.31849.75360

Wohlwill, J. F. and W. van Vliet. 1985. *Habitats for Children: The Impact of Density*. Hillsdale, N.J: L. Erlbaum Associates.